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By-Fargo, George A.; And Others

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Forty-two preschool children participated in this 2-year Head Start research project conducted at the University of Hawaii. The objectives of the overall project were (1) to focus interest on the need for early intervention with poorly-functioning preschool children with the intent to offer services of a preventive rather than remedial function; (2) to demonstrate the need for and value of an interdisciplinary approach to diagnosis and educational planning; and (3) to serve as a training function for prospective teachers and pediatric residents. Two other objectives were added for the second, or followup, year of the project: (1) assessment of the ability of the members of the original disciplinary team to predict success in school at the preschool level and (2) assessment of the progress of problem children who received the special education intervention. The objectives were successfully realized, and it was found that there was a need for more interdisciplinary services for children in Hawaii and a need for early identification of and educational and medical intervention with high-risk children. (WD)

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EVALUATION OF AN INTERDISCIPLINARY APPROACH TO PREVENTION OF EARLY SCHOOL FAILURE

Follow-up Study

George A. Fargo, Project Director
College of Education
University of Washington

Colleen P. Roth, Project Coordinator
Department of Educational Psychology
University of Hawaii

Theo M. Cade, Statistical Consultant
Educational Research and Development
University of Hawaii

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INTRODUCTION

This is the final report of the two-year preschool research project conducted by Special Education at the University of Hawaii, in cooperation with Kauikeolani Children's Hospital, the Hawaii Office of Economic Opportunity, the Department of Education of the State of Hawaii, and the Hawaii State Department of Health. It is concerned primarily with the second year or follow-up phase of this study. For details of the procedures and results of the first year's work, refer to the first and second Progress Reports (3, 10).

The original study was designed with three major objectives in mind. A review of the project at the end of the first year indicated that objectives for that year had, to a large degree, been fulfilled.

1. The first objective was to focus interest on the need for early intervention with the poorly-functioning preschool child with the intent to offer services of a preventive rather than a remedial level. As a result of teacher observations, parent interviews conducted by a social worker, pediatric and psychological work-ups, followed by an interdisciplinary team conference, the high risk children from the initial group of subjects appeared to be adequately identified. The specification of problems determined the kinds of interventions that were desirable and feasible for these problem children.

2. The second objective, to demonstrate the need for and the value of an interdisciplinary approach to diagnosis and educational planning was clearly met. Participants in

team conferences were impressed with the efficiency with which data from the various disciplines could be brought to bear in the over-all planning for an individual child. These planning conferences, occurred during the month of March, April and May of 1967 and were attended by a total of fifty-two individuals, including teachers, social workers, pediatricians, psychologists, public health nurses and graduate students in education. The conferences also served to call attention to the need for better methods of coordination and communication among the various agencies which may be involved with a given family.

3. The third objective, that of serving as a training function for prospective teachers and pediatric residents, is an ongoing one. Some twenty graduate students in special education and seven pediatric residents were involved in the study during its first year of operation.

The current follow-up study was designed to continue the above objectives and to add the following objectives: 1) to assess the ability of the members of the original disciplinary team to predict success in school at the pre-school level; and 2) to assess the progress of problem children who received a special education intervention.

The need to predict success in early school years has been given new importance by the findings of teachers and research workers in Headstart programs. Work with culturally disadvantaged children has focused attention on the poorly functioning preschool child and the need for early and accurate

assessment of his abilities so that appropriate planning may be done. The many recent efforts to assess the preschool and kindergarten child attest to this widespread concern. The studies of deHirsch (1), Ilg and Ames (5), McGahan (8), and Sprigle (11), are only a few of the recent works in this field. There are hundreds of screening devices, readiness check lists, behavior inventories, pupil performance lists, etc., which have been developed to predict the success or failure of a prospective preschool or kindergarten candidate.

As more and more children are enrolled in preschools, the ability of the preschool teacher to make judgments regarding the child's school adjustment has assumed greater importance. A recent study (13) has indicated that preschool teachers can be reliable predictors. Their opportunity to observe the child is unique in two respects: 1) it is an ongoing, day-to-day, longitudinal observation of the child's functioning as part of a group, as opposed to the short-term, special circumstance, one-to-one relationship which the child has with other professional workers such as the pediatrician or psychologist; and 2) it is a more objective observation than that of the child's parents who also observe him over a long period of time. The teacher is an indispensable member of the interdisciplinary team.

The second objective of the follow-up study, that of assessing the progress of problem children receiving special intervention, was feasible only on a small-scale clinical basis. In the early planning stages of the project, placement

of the children for follow-up had not been determined. At that time, four possibilities existed:

1. Assignment of one-half of the problem children, selected on a random basis, to the University Laboratory School. Children would be integrated into the ongoing University program and would also have tutorial services from a fellowship student on an individual basis. The other half of the problem children would be placed in the regular community kindergarten program.

2. Transfer of all forty-two children to the existing kindergarten settings in the community which they would normally attend, with one-half of the problem group, selected at random, receiving supplementary assistance from fellowship students in Special Education.

3. Transfer of one-half of the problem children on a random basis to a special preschool at Children's Hospital.

4. The total group of forty-two children to become part of a follow-up of Headstart, in a projected program to be conducted by the Hawaii State Department of Education.

These four possibilities reflect two major current approaches to the handling of children with special problems, namely, the addition of a transitional year of pre-primary experience; and the retention of the exceptional child within the regular classroom. A large percentage of children at the end of the preschool year are regarded as not yet ready for kindergarten. Ilg (5) and deHirsch (1) have made extensive studies of children's readiness for school entrance. The concept of "maturational lag" (1) refers to this general lack of readiness. It includes the varieties of immaturity in language reception and expression, in visual perceptual development, and in fine motor-coordination observed in the functioning of these children. For such children a transitional year of

pre-primary experience is coming to be regarded as an effective way to circumvent the problems of over-placement in school. The importance of the avoidance of failure at this early level for the child's subsequent intellectual and emotional growth can scarcely be over estimated.

A second current trend, this one coming primarily from the field of special education, is that of keeping a greater percentage of exceptional children in the regular classroom. This includes children with visual and hearing handicaps, as well as the emotionally disturbed and mentally retarded. In so far as the limits of this study are concerned, this applies particularly to the emotionally disturbed and those at the borderline level of intellectual functioning. A tutorial arrangement geared to the child's particular learning problem represents an effort to help him retain his place within the regular classroom. The results of recent research (6) comparing the academic and social progress of children in special classes with those retained in the regular classroom (in varying degrees and with different kinds of resource teacher or special tutoring arrangements) suggest that the over-all advantage lies with normal classroom participation to the fullest extent possible.

It was within this frame of reference that objectives, methods and procedures for the follow-up study were determined.

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METHODS AND PROCEDURES

In order to compare the predicted functioning of this group of Headstart children with their actual functioning one year later, the study was designed to repeat as many of the first year's procedures as possible. As a preliminary step, authorization was requested and received from the Director of Research of the State Department of Education to locate the first year's forty-two children in their various public school kindergartens and to seek the cooperation of the kindergarten teachers in carrying out the follow-up procedures. The consent of the Medical Director of Children's Hospital and the Director of Children's Health Services of the State Department of Health was also obtained.

Forty of the forty-two children who were originally members of the study were located. They had scattered from their original seven classrooms in five Headstart preschools to twenty-two kindergarten classrooms in eleven public elementary schools. Two of the children moved several times or were located so late in the study that the follow-up data could not be obtained. Thus, it will be noted that the N varies slightly for difference parts of the study.

Once children were located, the follow-up procedures could be undertaken as planned. The steps involved are described below.

A. Teacher Categories at End of Six Weeks of School

The intent of this step in the study was to make a comparison between Headstart teachers' categorization of these

children with that of the kindergarten teachers' one year later. The initial referral of the children participating in the first year project was made in the following way: at the end of the first six weeks of school the preschool teacher was asked to select six children from her class, three of whom she suspected would have problems when they entered kindergarten and three of whom she felt would function adequately. Teachers of seven classes in five Headstart preschools participated in this project, thus making up the total group of forty-two subjects, twenty-one designated as "Problem" children and twenty-one designated as "Non-Problem" children.

One year later kindergarten teachers were asked to make ratings after the first six weeks of school on a somewhat different basis since the children were now more widely dispersed. The kindergarten teacher, therefore, was asked to rate her entire class into "good", "average", and "poor" groupings, as to her expectations of their success in kindergarten. In this way she was required to consider the subjects in relation to her class as a whole. The ratings of "good" and "average" were grouped together to form the "non-problem" category; those classified as "poor" were designated as the "problem" group. The Problem and Non-Problem ratings of Headstart and kindergarten teachers were then compared.

B. Behavior Rating Scale

The behavior rating scale, especially designed for this study by the original project directors, was used in the same way in the follow-up study as it was in the first year in order that appropriate comparisons could be made. Each member of the participating interdisciplinary team*--teacher, psychologist and pediatrician--was asked to: 1) rate the child on each of the 35 items in the scale, 2) indicate, according to this judgment, whether the child should be considered as Problem or Non-Problem, and 3) rate the child's present kindergarten functioning on a 7 point scale ranging from "very successful" to "failing." (See 10, Appendix A) In this way three scale ratings were obtained for each child which were compared to the ratings obtained the previous year. The kindergarten teacher was also asked to make her ratings at the end of the first semester of school, so that her experience with the child in length of time coincided with that of the Headstart teacher. The psychologist and pediatric resident rated the children immediately upon completion of their examinations, which were similar to those given the previous year.

Following the team conference for each child, each team member was asked to re-rate the child as to whether he now considered the child to be Problem or Non-Problem and once

*A social worker was not available for the second year of the study.

again, to rate kindergarten functioning. In this way a measure of change in judgment regarding the child brought about by the opportunity to hear information and discussion contributed by other members of the team, could be made for individual team members and for the team as a whole.

C. Psychological Examinations

The original psychological test battery was repeated for the follow-up study. It consisted of the Stanford-Binet (Form L-M (12), the Illinois Test of Psycholinguistic Abilities (I.T.P.A.) (7), the Peabody Picture Vocabulary Test (P.P.V.T.) (2), and the Frostig Developmental Test of Visual Perception (4). While the procedure was the same, the psychologist was different for the follow-up study. This replication makes it possible to compare the performance of the Problem and Non-Problem groups with that of the previous year.

D. Pediatric Examination

Pediatric examinations were conducted by seven pediatric residents under the supervision of staff physicians of Kauikeolani Children's Hospital. Parents of twenty-eight of the original forty-two children involved in the study gave permission to have their children examined the second year. This examination replicated the procedures of the first year including a child and family case history, a physical examination, and a developmental screening test. (See 10, Appendices E, F, G) In addition, the Sprigle School Readiness Screening

Test (11) was also given. This was done to acquaint the pediatric residents with the instrument which was devised for use in pediatric offices as a brief, reliable screening test to assess children's readiness for school. It yields a rating of readiness for first grade in three categories: 1) not ready at this time; 2) readiness skills average to above average; and 3) readiness skills highly developed. A comparison is made of the Sprigle score with the Kauikeolani Children's Hosptial Developmental Screening Quotient (10, Appendix G) as determined by the pediatrician and with school readiness as judged by the psychologist.

All pediatric examinations took place at Kauikeolani Children's Hospital. A driver was employed to transport each child and his mother to and from the hospital. Laboratory tests and referrals to specialists for further examinations were undertaken if necessary. The results of the previous medical examinations for each child were available from the Children's Health Services Division, Hawaii State Department of Health.

E. Team Conference

When all data had been collected for the children in a given school, arrangements were made to hold the interdisciplinary team conference. In attendance were the teachers and school principal, psychologist, examining pediatric resident, staff pediatric supervisor, and project coordinator. For those children who had tutorial help as partof the study,

the student teacher was present. Also participating was the Community Action Program Coordinator for Nursing of the State Department of Health.

The team conference procedure followed a regular pattern for each child. There was a presentation of findings by the child's teacher, the psychologist, and the pediatric resident. This was followed by questions, discussions, clarification, and statement of the specific follow-up procedures required. Each member of the participating team was then asked to re-rate the child in the light of the preceding discussion, as to Problem or Non-Problem and present level of kindergarten functioning (Appendix B). Every effort was made to limit these conferences to discussions of the major relevant features so that the time spent on each child averaged between fifteen and twenty minutes. This was an unusually brief period for such conferences but entirely satisfactory from the point of view of the participants. All data for each child were summarized by the project director and sent to concerned participants. This included the pediatric supervisor, the principal of the appropriate school and the Community Action Program Coordinator for Nursing.

With this information available, two important comparisons were made:

1. The pre-conference and post-conference ratings of each child were compared to determine the effect of the conference upon the ratings made by the members of the inderdisciplinary team. This comparison was made for both years of the study.

2. The ability of the interdisciplinary team to predict level of functioning in kindergarten was tested by comparing the rating of the preschool year team with that of the kindergarten year team.

F. Educational Intervention with One-Half of Problem Group

Twenty of the original group of twenty-one children designated as Problem children by the interdisciplinary team conference were located and were available for the follow-up study. Ten of the twenty were chosen on a random basis (by entering a random number table) to receive special educational intervention. An updating of information on this group of ten was undertaken. All of these children were known to Children's Health Services of the State Department of Health. Information from public health nursing records was brought up to date. A conference with the kindergarten teacher of each of these children was held, with the school principal or school counselor participating in nearly all instances. This was done to determine the child's recent school progress and to plan with the school a program on an individual tutorial basis that seemed best suited to the child's needs.

Tutoring arrangements were made for eight of the ten children. The remaining two were regarded by their teachers as making satisfactory progress in school and not in need of special educational help. Two children were assigned to each of four graduate teaching fellows in Special Education at the University of Hawaii. They began their work in January, 1968

and continued through the first week of May, 1968. Each child was seen for approximately three half-hour periods per week. Tutors were instructed to adapt their methods to the needs of the child as they became better acquainted with his particular strengths and weaknesses. Most of the tutors began by using the Peabody Language Development Kit, Level #1. There were two reasons for this: first, it offers instruction in an area of deficit common to the group; and second, it provided the tutors with structured materials appropriate to this age level.

Since this was regarded as a learning experience for the teaching fellows as well as for the child, procedures were kept flexible. Tutors who felt their pupils might work well together tried this arrangement. Work periods were longer some days than others. Different types of materials and approaches were tried. Tutors discussed their problems with each other in a series of meetings and with members of the faculty of the Department of Educational Psychology. Notes were kept weekly regarding each child's progress, so that a record would be available at the end of the year. It seemed clear that evaluations of this part of the project would of necessity be an informal case analysis. Not only was the N (eight cases) small, but the tutorial intervention took place at the same time that the over-all reevaluation occurs, so that no pre- and post-measurement of educational intervention was possible on a statistical basis. In any event, such statistical evaluation has many problems of its own (Reynolds 9) not regarded as falling within the scope of this study.

G. Reports to Parents and Schools

A letter was written to the parents of each of the twenty-eight children who were brought in for medical examinations as a part of this follow-up study. This letter had four objectives: 1) to inform the parents of the findings of the case conference; 2) to make recommendations which came about as a result of the case conference; 3) to reinforce any medical recommendations which had been made at the time of the medical examination; and 4) to thank the parents for their participation in the project. For an example of one such letter, see Appendix D.

At the conclusions of the study, psychological test data were mailed to the appropriate school for inclusion in the children's cumulative files.

RESULTS

A. Teacher Categories at the End of Six Weeks of School

The comparison between Headstart categorization of this group of children with that made by kindergarten teachers one year later is shown in Table I.

Table I

Placement of Pupil into Problem and Non-Problem Categories by Headstart and Kindergarten Teachers

Children of Headstart teachers (1966)	Children of Kindergarten teachers (1967)
20 Problem	9 Problem 11 Non-Problem
20 Non-Problem	1 Problem 19 Non-Problem

Q = 3.57

Level of significance = .10 with 1 df

A Cochran Q test of the data in Table I yielded a significant difference between Headstart and Kindergarten teacher ratings only at the .10 level, indicating that there was no significant difference in the ratings of the two groups of teachers.

An inspection of Table I indicates that, except for one case, the entire change in teacher rating occurred in the Problem group: of the twenty children selected as Problem

children by Headstart teachers, only nine are so regarded by their kindergarten teachers one year later. There are a number of possible reasons as to why this shift occurred:

1. Hopefully, the Headstart experience itself has been a positive factor, aiding some children in making a successful adjustment to kindergarten earlier in the year than they might otherwise have done.

2. A change in the child's rate of development and general maturity level could affect his status in such a rating.

3. Changes in the child's family situation are important factors. In some cases it is known that parents were divorced or remarried, or other changes in the child's immediate family environment occurred.

4. The change in the child's school environment and his relationship to his teacher may be a definitive factor.

5. Some children experienced direct intervention resulting in improved physical health as a result of the medical examination and recommendations which were part of the first phase of this study.

6. The teacher may make an erroneous judgment.

7. Finally, one must also consider the positive effects which may result from the mere focusing of attention on these children as members of this study.

A useful piece of research would be the inquiry into these eleven cases on an individual, clinical level in order to determine the factors which brought about their improved school adjustment.

B. Behavior Rating Scale

1. Comparison of Problem and Non-Problem Groups.

The Behavior Rating Scale, composed of thirty-five items was used in several ways. Using the means of the total scale scores, a comparison between Problem and Non-Problem groups was made for the ratings of teachers, pediatricians and psychologists. The first year's procedure was replicated, and the results for both years are shown in Table II.

Table II

ANALYSIS OF BEHAVIOR RATING SCALE DATA

Comparison Between Problem and Non-Problem Group Means for Preschool and Kindergarten

	Problem Group			Non-Problem Group			
	N	Mean Score	Standard Deviation	N	Mean Score	Standard Deviation	t
Teachers							
Preschool N=7	22	139.82	29.23	20	186.35	22.32	5.62***
Kindergarten N=23	20	141.20	23.16	20	173.80	25.24	4.26***
Psychologists							
Preschool N=1	22	132.95	12.67	20	161.90	14.62	6.71***
Kindergarten N=1	20	163.75	24.10	20	177.40	13.85	2.20*
Pediatricians							
Preschool N=7	22	136.36	26.06	20	168.10	22.35	4.23***
Kindergarten N=7	12	148.67	25.76	16	179.50	23.05	3.33**

* Probability less than .05 that the difference between the means is attributable to chance.

** Probability less than .01 that the difference between the means is attributable to chance.

*** Probability less than .001 that the difference between the means is attributable to chance.

The Behavior Rating Scale developed for this study discriminated at a high level of significance between the Problem and Non-Problem groups when used during the same year in which the study was initiated. When used again a year later, it continued to discriminate significantly between the Problem and Non-Problem groups. At this time, greatest consistency with the teachers' initial ratings was made by the second year teachers' as raters (.001 level of significance) followed by the pediatricians (.01 level of significance) and by the psychologist (.05 level of significance).

Children who were regarded as Problem or Non-Problem children in preschool continued to remain so in kindergarten as measured by this instrument. It is perhaps to be expected that teachers who experience a long term relationship with the children involved are somewhat better predictors than the pediatricians and psychologist. It should also be noted that the original Problem and Non-Problem groups were chosen by teachers. Also, ratings between teachers and other teachers will perhaps be more similar than between teachers and other professionals. It should be recalled that the number of teacher raters was larger than the number of pediatrician and psychologist raters. Since the reliability of ratings increases as function of the number of raters, the differences found between the three professional groups may be in part or completely due to the greater number of teacher raters.

2. Prediction of level of Functioning

The Preschool teachers, pediatricians and the psychologist

were asked to predict on a seven point scale the level of functioning for each child in kindergarten. One year later the children were again rated as to their actual kindergarten functioning by these same groups of professionals. The correlation of these two ratings is shown in Table III.

Of particular interest in this table is the stability of rating within each profession. It will be seen that the correlation between teachers ratings is highest (.66), followed by that of the psychologists (.54), and then the pediatricians (.39). Three factors would seem to be important here. First, the teacher based her rating on a longer period of acquaintance with the children (approximately five months of the school year) than the psychologist who saw each child for about two hours, or the pediatrician whose acquaintance with each child was limited to approximately one hour. Secondly, the nature of the level of functioning rating itself is most closely related to the concerns of the teacher in the classroom and least to that of the medical profession. Finally, the larger number of teacher raters than pediatrician and psychologist raters must be considered.

Table III

Correlation of Level of Functioning Ratings
(Pre-Conference) Between the Preschool and Kindergarten
Years for Teachers, Psychologists and Pediatricians

	N	Teachers		Psychologists		Pediatricians	
		Preschool	Kindergarten	Preschool	Kindergarten	Preschool	Kindergarten
Teachers							
Preschool	40	--	0.66	0.66	0.53	0.43	0.59
Kindergarten				0.69	0.61	0.66	.62
Psychologists	40						
Preschool				--	0.54	0.63	0.47
Kindergarten					--	0.35*	0.63
Pediatricans	28						
Preschool						--	0.39*
Kindergarten							--

*These values significant at .05 level. All other values significant at .01 level.

C. Psychological Test Findings

Table IV compares the Problems and Non-Problem groups for psychological test results. This is a repetition of the first year's procedure, and the results for both years are shown on Table IV.

The psychological test data discriminated significantly between Problem and Non-Problem groups during the kindergarten year. In all tests the problem group continued to perform at a significantly lower level than the non-problem group. The P.P.V.T. discriminates at a lower level (.05) than the other tests (.01 and .001). An inspection of the quotients shows them to be a running markedly higher for the kindergarten year. It is not entirely clear as to why this should be. Actual increase in I.Q., practice effects, and difference in psychological examiners are all possible factors.

Table IV

ANALYSIS OF PSYCHOLOGICAL TEST DATA

Comparison Between Problem and Non-Problem Groups for Preschool and Kindergarten

	Problem		Non-Problem			
	N	Mean	N	Mean	t	Sign
Stanford-Binet M.A. (months)						
Preschool	22	48.27	20	58.15	5.794	.001
Kindergarter	21	66.14	19	80.05	5.212	.001
Stanford-Binet I.Q.						
Preschool	22	83.59	20	102.45	5.625	.001
Kindergarten	21	95.81	19	117.84	5.355	.001
P.P.V.T. M.A. (months)						
Preschool	22	40.32	20	48.30	4.066	.001
Kindergarten	21	59.48	19	68.42	2.696	.05
P.P.V.T. I.Q.						
Preschool	22	74.77	20	89.90	4.653	.001
Kindergarten	21	86.09	19	95.74	2.31	.05
I.T.P.A. Total Language Age						
Preschool	22	41.50	20	55.55	4.927	.001
Kindergarten	21	62.43	19	72.89	4.313	.001
Frostig Perceptual Quotient						
Preschool	22	80.82	20	93.70	3.739	.01
Kindergarten	21	100.62	19	110.00	3.181	.01

D. Medical Data

A comparison of Problem and Non-Problem preschool and kindergarten groups for certain of the medical data is shown in Table V.

Table V

ANALYSIS OF MEDICAL DATA

Comparison Between Problem and Non-Problem Groups for Preschool and Kindergarten

	Problem		Non-Problem			
	N	Mean	N	Mean	t	Sign
No. of chronic illnesses						
Preschool	21	0.19	19	0.00	2.01	n/s[a]
Kindergarten	12	0.00	16	0.00	0.0	n/s
No. of acute illnesses						
Preschool	21	0.57	19	0.90	0.62	n/s
Kindergarten	12	0.75	16	0.50	0.88	n/s
No. of new abnormalities						
Kindergarten	12	1.08	16	0.75	1.05	n/s

[a] insignificant

The medical data was not quantified in the same way as the psychological and Behavior Rating Scale Data because of the wide scope of problems involved. Only a small number of comparisons were made and no significant difference was found between the Problem and Non-Problem groups for these categories. The number of chronic illnesses and the number of acute illnesses were compared for the preschool and kindergarten years. There was no significant difference between Problem and

Non-Problem groups in the numbers of new abnormalities found when the children were re-examined during the kindergarten year.

The intercorrelations of the two developmental ratings obtained as part of the medical examination (Sprigle School Readiness Screening Test, Developmental Quotient) and the rating made by the psychologist are shown in Table VI.

Table VI

CORRELATION OF DEVELOPMENTAL RATINGS

(N=26)

	Sprigle Rating	Developmental Quotient	Psychologist's Rating
Sprigle Rating	---	0.62[a]	0.57[a]
Developmental Quotient	---	---	0.58[a]

[a] Significant at .01 level.

While it will be noted that all correlations are in a positive direction, the highest correlation is between the Sprigle Test rating and the Developmental Quotient. These two ratings were made by the same rater as a result of his examination of a given child on a given day.

In evaluating the correlations presented in this table, several interrelationships of variables must be taken into consideration: 1) several pediatricians were involved, but only one psychologist made all psychological ratings; 2) the times the children were seen varied over a two month period;

and 3) the scales themselves vary somewhat in what they purport to measure. The Developmental Quotient in particular differs from the other two in that it is more concerned with motor than with cognitive tasks. Also, the children at the age of 5 years are for the most part functioning at the ceiling of this scale.

Of particular interest in this table is the correlation between the Sprigle School Readiness Screening Test and the psychologist's rating. While not very high, it would seem to be adequate to encourage the use of the Sprigle Test as a brief and easily administered measure of school readiness as a part of the pediatric examination. The Sprigle Test is regarded as a screening device only. Children who fall in the below average category or about whom there is some question as to their behavior on the test would be referred for further examination.

E. Team Conference

Two kinds of statistical data are of particular interest concerning the team conference. First, as a result of the conference each member of the team was asked to re-rate the child as to level of functioning in the light of conference discussion. A correlation of pre- and post-ratings for both the preschool and kindergarten years, for the teachers, pediatricians and psychologists is shown in Table VII.

Table VII

Correlation of Pre-Conference and Post-Conference Level of Functioning Ratings for Teachers, Psychologists and Pediatricians

	Preschool Year (N=40)	Kindergarten Year (N=28)
Teachers	0.83	0.87
Psychologists	0.88	0.71
Pediatricians	0.80	0.83

All correlations are significant at the .01 level

Changes in level of function ratings as a result of conference discussion are small. It will be noted that, with the exception of the Preschool year psychologist, teachers tended to make even fewer changes in ratings than the others. Perhaps this might be expected in view of their longer and more complete experience with the children.

Second, the prediction of level of functioning in kindergarten made by the team during the preschool as a

result of its conference is compared with the rating of level of functioning made by the team as a result of the conference during the kindergarten year. This tests the ability of the interdisciplinary team to predict level of school functioning as measured by this study. This correlation is:

$$r = 0.79$$

This is significant at the .01 level. In so far as educational research is concerned, this may be regarded as a rather high correlation. It is particularly significant when it is compared with the predictions of the members of the team considered as separate professions, as shown in Table III. It will be seen that the judgment of the interdisciplinary team, as a result of case conferencing is superior to that of each profession alone.

It should be noted that the increased number of raters and greater variance would account for some increase in correlation in the team ratings over the individual ratings. The true increase in predictive ability cannot be determined within the design of this study.

F. Educational Intervention with One-Half of Problem Group

Upon completion of the tutorial phase of the study, each tutor wrote an account of her work with each child and her evaluation of what had been accomplished. (See Appendix C for an example of these reports). Each of the eight experiences was an individual one, and although only tentative generalizations may be made from such a small group, there are some interesting and instructive observations.

Notable are the different physical surroundings in which the teachers worked, depending upon the facilities available at the different schools. These ranged all the way from a poorly lighted teacher's lounge with inadequate seating and table-work facilities, to a well-equipped kindergarten classroom available during a period when the class was scheduled elsewhere.

The total number of sessions which each child had with his tutor varied widely also. Two of the eight children were absent frequently because of illness, and they missed many sessions. In one instance the tutor unavoidably missed six consecutive sessions. Tutors agreed that a 15 or 20 minute period three times a week is not enough time for maximum gains in learning. This is especially true when cancellation of periods by vacations, illness, etc., are taken into account.

Two tutors were frustrated by the difficulties of finding a suitable time to meet with the child's teacher. Teachers were so busy that the only time available was during the class' afternoon nap time. Even during this period the

teacher was needed in the classroom so that the conference situation was unfavorable. Consequently, the tutors felt that they were not able to work in full cooperation with the school staff.

Another point of interest is the differing way in which the students viewed the tutoring experience. At least two of the children expressed their pleasure at having a special teacher and appeared to gain in self-concept and in status among their peers by being taken from the classroom for individual attention. On the other hand, one boy seemed to find it embarrassing and almost in the nature of a punishment to have to leave the classroom with his tutor. He, it should be noted, is the child who received the fewest tutorial sessions for the reasons mentioned above. Tutors observed that the attitude of the teacher toward the arrival of the tutor and her taking the child from the classroom was reflected by the child. If the teacher indicated by her attitude that she regarded this as a valuable and special privilege, the child was helped to have a positive attitude toward the experience. Likewise, if the teacher indicated by her doubtful expression or her indifferent attitude that this did not have her support, it tended to have a negative effect.

One other variable should be mentioned as far as tutoring arrangements are concerned, and that has to do with finding a time which is equally suitable to the child, the teacher, and the tutor. In five of the eight cases this aspect of the tutoring process was regarded as unsatisfactory. The children

were reluctant to miss recess or free activity time, and the teachers did not want them to miss scheduled work time. Only a few children of this age are able to skip nap time profitably. Finally, the tutor who must come in from the outside does not have a flexible schedule. All tutors felt that this constituted a real problem which was not satisfactorily solved.

The basic question to be asked of the tutorial intervention program is whether or not the children made any gains in learning they would not otherwise have made. Both classroom teachers and tutors could see some gains, although they were not objectively measured. Gains reported by tutors were in the areas of gross motor-coordination such as hopping and skipping, in following verbal directions, and in increased length of attention span. The question which cannot be so easily answered is how much carry over there is in these areas into the regular classroom. More specifically defined areas of achievement could be seen by both tutor and teacher. These included learning the names of colors and learning to recognize one's name.

The tutorial program may also be looked at from the point of view of teacher training. Did the tutors themselves learn anything from this experience? The following observations were made by the tutors:

1. For three of the four teachers this represented their first work with children of this age level on a formal teaching basis. They acquired a feel for the pace and level at which kindergarten children operate. This was augmented

by their observation periods of the class as a whole.

2. They became acquainted with some of the materials which may be used to develop skills at this age level in the areas of language development particularly, but also in motor coordination, visual perception and sequencing.

3. Attending the interdisciplinary case conferences on these children provided them with experiences in the team approach to working with children. They could appreciate in a first-hand way the importance of the knowledge which the classroom teacher is able to bring to such a conference.

4. One tutor felt that it was a valuable experience in understanding what the role of a resource teacher would be like. This is likely to be a role which more and more teachers trained in special education will be filling in the future.

5. One tutor, who had contact with the children's parents, found this to be a worthwhile experience. For both of the children she tutored, the parents liked being called and informed of the nature of the special help their child was receiving. Both of these parents were in turn helpful to the tutor by calling her on days when their child was absent from school and so would not be available.

Summary and Conclusions

This two-year interdisciplinary study has concerned itself with demonstration, prediction, teacher training, and intervention aspects of the prevention of early school failure. It was undertaken by Special Education at the University of Hawaii in cooperation with Kauikeolani Children's Hospital, the Hawaii Office of Economic Opportunity, the Department of Education of the State of Hawaii, and the Hawaii State Department of Health.

One of the objectives of this study was to demonstrate the need for and the value of an interdisciplinary approach to diagnosis and educational planning. Heretofore a team approach to the use of diagnostic services of this type has not been widely used in Hawaii. During the first year of the study fifty-two people including teachers, social workers, pediatricians, a psychologist, public health nurses and graduate students in educatinn were involved in the study and interdisciplinary conferences. Forty-five such people participated during the second year.

The follow-up study was able to assess by statistical analysis the ability of the members of the disciplinary team to predict success in school at this early level. It was found that the ability of teachers, psychologists and pediatricians as individuals to predict success was moderately high on the whole. The ability of the interdisciplinary team to predict success was higher. These results appear to

support the intent of this study to demonstrate the value of the interdisciplinary approach to diagnostic problems.

The role of the teacher as an indispensable member of the interdisciplinary team has also been born out by the results of this study. The teachers' prediction of level of functioning was higher than that of the pediatricians or psychologists. The teacher's thorough knowledge of the child as he behaves as a member of his group over an extended period of time and under varying circumstances is of fundamental importance in assessment and planning for the individual child.

Perhaps one of the deterrents to including the child's teachers in case conferences in the past has been not so much an underevaluation of her contribution, as it has been in overcoming the difficulties in releasing her from the classroom. Certainly this kind of scheduling constituted a real problem which had to be overcome in carrying out the procedures of the present study. It was solved by special cooperation on the part of all who were involved. Many conferences were held at the lunch hour, so that everyone contributed part of their noon break in order to attend. Some were held after school, which represented a special contribution on the part of the teacher. For all conferences held during school hours, noon or otherwise, it was necessary for the principal or the teacher to arrange to have the class supervised by an assistant teacher or volunteer parent.

Despite these difficulties, the importance of teacher participation as a member of the interdisciplinary team is such that provisions for her attendance should be made. As schools move further along in new types of team teaching and assistant teacher and teacher aide arrangements, perhaps this particular kind of scheduling problem will diminish in importance.

Another important objective of this study was to focus interest upon the need for early intervention with the poorly functioning preschool child with the intent to offer services at a preventive rather than a remedial level. During the first year of the study the high risk children from our group of subjects were identified by means of an interdisciplinary team conference which followed the teacher and student observer classroom observations, parent interviews conducted by the social worker and pediatric and psychological work-ups. The facilities available allowed half of this group of problem children to be selected for special educational intervention. These children then received special tutoring by teaching fellows in Special Education at the University of Hawaii.

While this part of the study did not lend itself to statistical analysis, it is believed that both the children and the teaching fellows involved experienced some gains. More striking, however, are some of the problems in effecting and measuring change which were pointed out by this effort at tutorial intervention at this early age level. These include problems of time available for tutorial sessions, of space

available, of teacher-pupil attitudes toward such intervention, and of choosing the right techniques for the individual child. Even though every effort was made to prescribe individually the tutorial procedure for each child, it did not seem in every case that tutorial intervention was an effective treatment. Prescribing tutorial intervention for a given group for research purposes points up the need for a more flexible and wider choice of kinds for intervention.

All of the children who participated in the study (forty-two the first year, forty the second year) received service believed to be of value. First, every child received a careful medical examination with medical follow-up procedures. As a result of these examinations the following procedures were undertaken:

1. Corrective surgery
2. Audiometric and otological tests
3. Corrective dental procedures
4. Psychiatric referral
5. Electroencephalograms
6. Vision tests and fitting of glasses
7. Genetic survey
8. X-ray studies
9. Endocrinological study
10. Referral to allergy clinic
11. Speech therapy
12. Neurological evaluation
13. Recommendation and follow-up procedures for placement in private school with enriched program

The over-all health of the child is of fundamental importance in his functioning in school. The above list represents a broad scope of medical problems indicative of the importance of careful medical examination and follow-up. It points to the need for more comprehensive medical care for the children of this State. The importance of both

careful diagnosis and adequate follow-up with coordination of effort of both public and private agencies can hardly be over-emphasized.

Every child received a careful psychological examination, which was repeated the second year. All psychological test records were sent to the schools at the close of the study for inclusion in cumulative record files.

Immediately following the case conferences a summary of the conference proceedings was sent to the school for their use.

A letter was written to the parents stating the findings and recommendations of the case conference in order to aid them in continuing any follow-up procedures which may have been recommended.

Finally, the intent of the original study to serve as a training function for prospective educators and pediatric residents, was continued during the follow-up year. During the first year, some twenty graduate students in special education and seven pediatric residents were involved in the study. During the second year, four teaching fellows in special education were intensively involved as tutors in the tutorial instruction aspect of the study. Seven pediatric residents also participated in the second year of the study. In addition to the medical examination and developmental scale used during the first year, the Sprigle School Readiness Screening Test was added to the pediatric examination so that the residents might become acquainted with this Scale for use in pediatric practice.

Were such a study as this to be carried on in the future there are some changes which might be made in order to improve its operation.

1. In so far as the use of graduate students is concerned, it might be more closely integrated with the course work and graduate research in Educational Psychology. Case studied at the graduate level could be assigned from this pool of rather extensive information about individual children.

2. As the same children were followed through this school year, valuable longitudinal studies could be made, also appropriate for graduate study. The meaning of the prediction of school functioning would gain in value as the same group of children were followed over a long period of time.

3. New groups of children beginning at the preschool level could be added in the maintenance of an on-going program of service, research and training.

This study has served to point up the need for more interdisciplinary services for children in the State of Hawaii. It has stressed the importance of early identification and educational and medical intervention with high-risk children. And it has emphasized the role of the teacher in the diagnostic and therapeutic process. It is hoped that progress in these areas will continue in the future through the cooperation of public and private agencies in Hawaii concerned with the health, education and welfare of children.

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APPENDIX A

University of Hawaii
Special Education
3/19/68

PRESCHOOL PROJECT

CONFERENCE EVALUATION

Child's name _____

Rater's name _____

I would designate this child as _____Problem child

_____Non-Problem child

I think this child's functioning in kindergarten may be characterized as:

Check one.

_____Very successful

_____Doing well

_____Functioning normally

_____Having problems sometimes

_____Having problems often

_____Having problems most of the time

_____Failing

APPENDIX B

CONFIDENTIAL INFORMATION

SUMMARY OF CONFERENCE PROCEEDINGS

Preschool Follow-up Project Conference, April 30, 1968, Kalihi-Kai School

Present: Children's Hospital: Dr. R. Platou, Dr. M. Bassett, Dr. K. Y. Wong, Mrs. B. Hahn
Project Staff: Mrs. E. Garrigus, Mrs. C. Roth, Mrs. B. Haddon
State Department of Health: Mrs. M. Miyashiro

Child: (male)

Teacher's Report: This is one of the top children in the class. He is picky about food and does not eat all of the items presented at lunch. His social adjustment is good: he is well liked by both boys and girls; he enjoys taking part in group activities. He shows initiative and assumes responsibility very well, reminding the teacher of things he is supposed to do, such as speech therapy. His emotional adjustment is good: he adjusts easily to new situations and accepts suggestions readily. He finishes his work on time and uses his time to good advantage. He comprehends movies and stories very well and can discuss things on a high level. He has a very good vocabulary, but does not use all of the words that he knows. He can tell likenesses and differences, knows his numbers to 10, and knows the days of the week.

Psychologist's Report: Child tested at CA 5-7. Test results are as follows: Stanford Binet IQ 152, M.A. 8-2; PPVT IQ 74, M.A. 4-2; ITPA Language Age 6-9; Frostig Perceptual Quotient 118+. Child is alert, eager, enthusiastic, and a delight to work with. He is articulate, although when he tries to speak too rapidly he can be difficult to understand He listens, follows directions well, and is a neat and careful worker. These tests represent a valid account of his present functioning level. He scored well on comprehension items and very well in relating ideas in a meaningful way, especially in the visual-motor area. He has good expressive ability and did relatively good work with memory materials. His visual perception and eye-hand coordination tests scored very high. Child is functioning in the very superior range of mental ability and is quite accelerated for first grade.

Pediatrician's Report: Child is well developed and well nourished, with normal birth and developmental history. Following first project examination last year, child was operated on for undescended testis, with good results. Eye examination

indicates slight sixth nerve weakness in left eye; opthamalogical examination is recommended. He has carious teeth and enamel hypoplasia; should be referred to dental clinic. Child was inattentive during Sprigle School Readiness Screening Test, and there is some question about the accuracy of the result: scored within the average to above average range. Developmental Quotient 100+. Recommendations: 1) Flouride intake and dental care; 2) continue speech therapy; 3) opthamalogical examination. An examination by family pediatrician has been arranged.

Discussion: Eye difficulty may be considered as minor, requiring either simple orthoptic exercises, a patch on right eye, or fake glasses. Dental care and flouride treatment is very important. A child of this superior intellectual capacity and good social and emotional adjustment is much in need of an enriched school program. He will be placed in the fast first grade grouping.

Seven of the seven members present at the conference categorized the child as Non-Problem. Consensus is that he is very successful in kindergarten.

APPENDIX C

SAMPLE CASE SUMMARY OF TUTORIAL INTERVENTION

A. was referred by the teacher with the request that he receive help in the areas of eye-hand coordination and following directions. During our first session I administered the Purdue Perceptual Motor Survey. From this test I learned that A. had trouble hopping and skipping, and difficulty working in two dimensions. He seemed to have a fairly good command of language, but he did not know colors and numbers.

Several activities were tried with A. in an attempt to alleviate some of his difficulties. Rhythm records and songs were used to help him learn to hop and skip. Work with another child in this area also helped. A. made some progress in this area, but his skipping still looks more like a slow run, and he seems to have much difficulty hopping on his left foot. He seems to be left handed and right footed.

Emphasis on following directions was handled by giving verbal directions and waiting to see that they were carried out correctly. Games such as "Simon Says" were also used.

More emphasis was put on the area of eye-hand coordination, especially his difficulty in working in two dimensions. A. practices connecting dots, which he was initially unable to do. We also worked with puzzles, and he seemed to be fairly proficient in this area. We drew his outline on a large piece of paper and he colored the picture. He also practiced coloring shapes and staying within the lines. A. gained some proficiency in this area, but still needs more help. His teacher complains that he works too slowly. She mentioned that the time that I worked with A. took him away from art period so that he got less practice in working with two dimensions.

The Peabody Language Development Kit was used as the primary tool in the language area. A. seemed to be able to grasp some new concepts rather easily. He knows most of the animals, clothes and household articles. He mastered the colors through our sessions, though frequent absences prevented intensive work on numbers which he needed.

At the end of the sessions, A's teacher seemed to feel that his greatest gain was in learning the colors. I feel, however, that other rather significant gains were made. A. seemed to be able to verbalize well when asked to do so. He could speak in complete sentences and describe pictures in detail. He seemed to make some progress in the area of fine-motor and eye-hand coordination. It is possible that A's left handedness was not recognized when he began Headstart

and so did not receive helpful compensations such as left-handed scissors and other adjustments. Generally, I feel that A. profited from the tutoring sessions. He still needs help, but he is a bit farther ahead than before.

APPENDIX D

June 4, 1968

Dear Mr. and Mrs. K:

The follow-up study of the Preschool Project started last year by Children's Hospital and Special Education here at the University is nearing completion. One of the goals of the study was to see if we could find better ways of discovering physical and school problems before first grade. We want to thank you and your child for taking part in this project, and we believe that you would like to have a report from us.

K's teacher, the doctor who gave him the medical examination and the psychologist who did the testing, met together a few days ago. K. has shown improvement during this kindergarten year: he is more cooperative and better able to get along with the other children than at the beginning of school. His art work is especially good, and he has made many excellent drawings. His reading readiness work in preparation for first grade is satisfactory. The psychologist found him to be a calm and cooperative child of normal mental ability.

The doctor found K. to be in generally good health. The hearing loss which was noted last year was rechecked, and his hearing appears to be normal at the present time. However, he has several cavities in his teeth, and this should be taken care of either through your own dentist or at the Strong-Carter Dental Clinic. The doctor was also concerned that K. is somewhat overweight for his height and age. This should be watched so that it does not get out of hand. Finally, in view of the history of diabetes in the family, a check of his urine once a year is quite important.

The group was impressed with K's artistic ability and thought that he might very much enjoy summer art classes. We checked the Honolulu Art Academy, but found their classes already full for the summer, and no scholarship funds available. Perhaps the school can suggest something for him that he would enjoy.

Again, we all wish to thank you for your interest and cooperation in this project. It is through the efforts of all of us working together that we hope to improve the health, the education and the opportunities for all of the children of Hawaii.

Sincerely yours,

(Mrs.) Colleen Roth
Project Director

Miyoko Bassett, M.D.
Director, Out-Patient Clinic
Children's Hospital